MASTER OF SCIENCE
IN
MANAGEMENT

LIFE CYCLE MANAGEMENT OF BAHRAINI AMIRI AIR FORCE F-16 AIRCRAFT

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This thesis presents a general scheme for implementing Life Cycle Management (LCM) in the Bahrain Defense Force (BDF) and Bahrain Amiri Air Force (BAAF), with special attention paid to LCM issues for the F16 weapon system. The current situation of Bahrain, as well as the history and current challenges facing the BAAF in managing its F16s, are presented. Those challenges are to reduce the Total Ownership Cost (TOC) of the F16 fleet to the bare minimum without disturbing the defensive posture of the BDF and BAAF.

The related concepts of LCM, TOC, and Reduction in Total Ownership (R-TOC) are discussed in general, and also in the context of the BAAF F16 force. A feasible method of applying these methods to the BAAF's current situation is then presented in the form of recommended policies, procedures, roles, and responsibilities. Processes and procedures for use by both the BAAF and its suppliers in the management of resources are also recommended. These address all phases of the F16 life cycle (development, deployment, operation, maintenance, management, and retirement).

The advantages associated with developing data and management systems for identification and tracking of the Total Ownership Cost (TOC) of the BAAF F-16 are likewise emphasized. They allow management to make effective trade-off decisions regarding the acceptance or rejection of modifications and upgrades.

To demonstrate the method, an assessment of BAAF F16 Operations and Support (O&S) costs are also provided, with some of the data being generic and unclassified. Analysis of these data suggests significant cost savings to the BAAF are possible through changes in operational and support procedures, and specifically, through consolidation of support operations, elimination of some functions and consolidation of others. The implementation of these LCM procedures can be applied to other aircraft types in the BAAF, including the F16's replacement.

DoD KEY TECHNOLOGY AREA: Air Vehicles

KEYWORDS: Bahrain F16 Force, Life Cycle Costs, Life Cycle Management

DEVELOPING A MODEL TO ASSESS INFORMATION TECHNOLOGY INVESTMENT MANAGEMENT IN GOVERNMENT AGENCIES

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In fiscal year 1994, the federal government obligated more than $23.5 billion towards information technology (IT) products and services, which represents about five percent of its total discretionary spending. The Clinger-Cohen Act of 1996 was enacted by the U.S. Congress to help prevent wasteful government spending on IT projects by mandating that federal agencies develop a process to manage their IT projects as investments, including methods to continuously improve the efficiency and effectiveness of their management processes. The goal of this study was to develop a model to assess a government agency's IT management processes, specifically the selection, control, and evaluation of IT investments. In order to accomplish this, various General Accounting Office (GAO) reports were reviewed to determine the best practices being used to manage IT investments. Also, a model was developed that can be applied to an agency that already has some IT management processes in place. The major finding was that, while the critical processes and attributes identified by GAO are helpful in implementing improvements to an agency's processes, each individual agency needs to carefully assess the environment in which it operates and choose the management tools and techniques that best fit the agency's vision and mission and its specific environment.

DoD KEY TECHNOLOGY AREA: Other (Information Technology Management)

KEYWORDS: Information Technology Management, Information Technology Investment, Clinger-Cohen Act

ANALYSIS OF CHANGES IN FEDERAL FINANCIAL RATIOS

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During the past decade, Congress has passed legislation in an attempt to improve federal accounting practices. Furthermore, the Office of Management and Budget standardized the format for federal entities to follow in preparing their annual financial statements. The central objective of this study was to analyze the patterns over time in federal financial ratios created from data contained in these annual statements. The study examined the form and content of the new federal financial statements and developed and applied a framework of 31 financial ratios to the FY 1998, 1999 and 2000 financial statements of 22 of the 24 federal entities affected by the CFO Act of 1990. It analyzed ratio values in order to answer: (1) What patterns in financial ratio values exist across the various entities of the federal government? (2) What changes occur in federal entities' financial ratios over time? (3) What growth trends exist in financial ratios over time, and how consistent are those trends? (4) How stable are the financial ratios? (5) How do the various financial ratios correlate to one another, and how stable are these ratio relationships over time? Although there exists no strong evidence for overall trends in federal financial ratios, the ratios are informative in the sense that they discriminate both between the entities and across time; if differences exist between the financial conditions of the entities, or if changes in a particular entity's financial condition occur over time, the ratios will detect them.

DoD KEY TECHNOLOGY AREA: Other (Federal Financial Analysis)

KEYWORDS: Federal Government, Financial Ratios of Financial Condition, Indicators of Federal Government Agency Financial/Economic Health

AN ANALYSIS OF THE F/A-18 E/F INTEGRATED READINESS SUPPORT TEAMING (FIRST) PROGRAM (DRAFT)

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Department of Defense logistics are under increasing pressure to reduce their cost of operations. As a result of many years of reliability and aging aircraft issues facing our Naval Aviation Fleet, a maintenance support contract has been developed to attempt to maintain the high reliability of the F/A-18 E/F type aircraft. Although contract logistics support has been around since World War II, the F/A-18 E/F Integrated Readiness Support Teaming program (FIRST) has extended this support to a new level as the contractor virtually assumes the role as the Inventory Control Point for this aircraft.

This research examines F/A-18 E/F program reliability and supportability issues. We assess the FIRST contract with particular regard to how this contract will affect the parts supportability aspects as well as the maintainability/reliability rates of the aircraft and life cycle costs. An important part of this research effort is the literature review. As yet, there are no studies available on the FIRST draft that might have assisted in evaluating the program. We obtained copies of the FIRST draft along with the Task Description Document and the Awards Fee Plan. The resulting analysis and conclusions discuss these elements and provide recommendations for improvement.

DoD KEY TECHNOLOGY AREA: Other (Parts Supportability, Reliability and Aging Aircraft)

KEYWORDS: Logistics, Maintenance, Outsourcing, Contractor Logistics Support, F/A-18E/F Aircraft

THE REQUIRED RESTRUCTURING PROCESS FOR THE ROMANIAN ARMED FORCES: MAJOR STEP TOWARD NATO MEMBERSHIP

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The transformation of the political relations in Europe at the dawn of the 21st Century resulted in deep changes in the concept of security and collective defense.

In the context of NATO enlargement, Romania, like other Central and Eastern European countries, reconsidered its political and strategic position in this new environment, started profound reforms in its security institutions and continues to consolidate the democratic statecraft.

This thesis examines the steps Romania, as an aspiring country, has to complete for the admission into the Alliance. The analysis mainly focuses on the process of defense resource allocation and reorganization of the Armed Forces as requirements imposed by NATO through the concept of the Membership Action Plan. A detailed description of the defense resource allocation process is presented and analyzed against relevant theory on policy analysis and contemporary budgeting systems, in particular PPBS.

The analysis concludes that through the implementation of the new defense resource management system and reorganization of the Armed Forces, Romania can meet its defense needs and become an important military contributor to NATO.

DoD KEY TECHNOLOGY AREA: Other (Romania, Force Structure, Defense Resource Allocation)

KEYWORDS: Reorganization of the Romanian Armed Forces, Defense Resource Allocation Process, NATO enlargement, New European Security Environment

ANALYSIS OF INTER/INTRA SHIP MATERIEL MOVEMENT IN SEA BASED LOGISTICS USING SIMULATION

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Operational Maneuver From the Sea (OMFTS) and its implementing concept, Sea Based Logistics (SBL), stress the need for logistically supporting forces ashore directly from a sea base. This implies a radically different approach for supporting forces ashore in the future. This study analyzes the concept of SBL in the area of inter-ship and intra-ship movement of materiel as well as ship-to-objective materiel movement in order to gain insight into the envisioned SBL support concept. This study presents a conceptual model blending aspects of current underway replenishment (UNREP) processes with an operational scenario incorporating the tenets of the OMFTS and SBL concepts. A baseline simulation model was developed to estimate UNREP cycle times under various scenarios. Experiments were conducted by modifying the baseline model to assess the impact on inter/intra ship materiel movement cycle time by increasing the lift capacity of the helicopters used for vertical replenishment (VERTREP) as well as increasing the number helicopters used for VERTREP. Results indicate that an increase in helicopter lift capacity significantly reduce overall cycle time, more importantly UNREP cycle time. The simulation model identifies constraining resources (i.e., elevators and forklifts) that are on the critical path of operations. Results of this thesis will eventually help to configure the amphibious ships used for SBL in the future.

DoD KEY TECHNOLOGY AREA: Modeling and Simulation

KEYWORDS: Modeling and Simulation, Sea Based Logistics, Expeditionary Logistics, Underway Replenishment

A MODEL FOR TRAINING, EDUCATION AND DEVELOPMENT OF U.S. NAVY PATROL COASTAL BOAT (PC) PERSONNEL USING DISTRIBUTED LEARNING TECHNOLOGIES

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This research will define, assess, and evaluate current training, education and development practices and recommend cost effective measures for improvements at U.S. Naval Patrol Coastal Boat (PC) facilities.

The objective is to propose a model for training technology infusion in Patrol Coastal Boats (PC) which will enable all sailors and officers assigned to these units to engage in training, education, and development activities without leaving the confines of the ship.

Research will include conducting a detailed analysis of current training policies, conducting in-depth reviews of the current educational infrastructure, identifying and recommending pertinent distributed learning programs, and conducting a cost and benefits analysis of implementing distributed learning technologies onboard a PC.

DoD KEY TECHNOLOGY AREAS: Computing and Software, Manpower, Personnel, and Training

KEYWORDS: Distributed Learning, Distributed Learning Technologies, Adult Learning, Patrol Coastal Boat (PC), Internet-based Learning, Education and Training, Manpower, Personnel, and Training

A COMPARATIVE ANALYSIS OF RISK MANAGEMENT PLANS WITHIN THE DEFENSE CONTRACT MANAGEMENT AGENCY

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This thesis performs a comparative analysis of a sampling of risk management plans for strategic and critical suppliers administered by the Defense Contract Management District West (DCMDW) in order to identify the areas of highest risk and the most common tools used to mitigate risk in key processes and systems for these suppliers.

The Defense Contract Management Agency (DCMA) uses a comprehensive, inclusive, and iterative approach to risk management. It follows the Government and DoD risk management premise of using a five-step approach to risk management and the basic idea of identifying and assessing key processes/systems whose risk, either through probability or potential impact, offers the most cause for concern from a performance, schedule, or cost perspective. It employs current information technology, Risk Assessment and Management Program (RAMP) to provide consistency, commonality, access, and comparability to its risk management process.

Performance and schedule, product support and supplier quality assurance for product quality, and delivery were the areas of highest risk for DCMA. The most commonly applied risk handling tools indicated in the RAMP database were areas associated with analysis, monitoring, and surveillance activities before final inspection: Data Analysis, Product Audits, System Evaluation, and Corrective Action.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Risk Management, Contract Administration

AN ASSESSMENT OF THE WORLD WIDE EXPRESS (WWX) PROGRAM AND ITS EFFECTS ON CUSTOMER WAIT TIME (CWT) AND READINESS

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This thesis examines the benefits of implementing the Word Wide Express program to the Arabian Gulf. To perform this analysis, wholesale mean fill times were measured for items shipped via the Air Mobility Command and World Wide Express program. The Air Mobility Command and World Wide Express program data were then compared to determine how Customer Wait Time (CWT) and readiness were affected for Aircraft Carriers deployed to the Arabian Gulf. The second objective was to determine if World Wide Express program had an effect on customer confidence and determine the perception of the defense transportation service. A comprehensive analysis was conducted using data obtained through the RAND Corporation for four Aircraft Carriers deployed to the Arabian Gulf, two from each fleet. Our results indicated that the World Wide Express program does show improvements in wholesale mean fill time and Customer Wait Times for aircraft carriers deployed to the Arabian Gulf. These improvements translate to a minimal increase in readiness rates for Pacific Fleet aircraft carriers and no improvement for Atlantic Fleet aircraft carriers. Additionally, confidence levels were shown to be higher by survey participants when using the World Wide Express Program.

DoD KEY TECHNOLOGY AREA: Other (Transportation Logistics)

KEYWORDS: Worldwide Express (WWX), Air Mobility Command (AMC), Transportation, Federal Express (FedEx), United Parcel Service (UPS), DHL, Air Transportation, Logistics, Commercial Aircraft, Airlift Operations

ARMY SMALL BUSINESS INNOVATION RESEARCH: A SURVEY OF PHASE II AWARDEES

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The shift towards qualifying performance and accounting for results has dramatically changed the way Government executes public policy objectives. The advent of the Government Performance and Results Act (GPRA) places the responsibility for gathering this information upon each Federal activity subject to its provisions. The Army Small Business Innovation Research (SBIR) program must now find a way to qualify its performance and determine what results are derived from a program that expends in excess of $100,000,000 annually on research. This thesis analyzes Army SBIR commercialization rates against a National Science Foundation study of DoD Fast Track and DoD Control Group awards. It provides an objective measure of program results that program officials can use to submit their annual GPRA performance reports. The thesis studied 37 SBIR Phase II firms and established a performance baseline. The thesis concludes that Army SBIR awards are outperforming DoD Fast Track and DoD Control Groups in the critical area of average commercial sales per award. It recommends a reduced focus on outside investment and a survey strategy that uses small sample sizes to qualify program performance. It concludes with a proposed survey instrument that Army SBIR managers can use to capture future program outcomes.

DoD KEY TECHNOLOGY AREAS: Manufacturing Science and Technology, Other (Small Business Innovation Research Program)

KEYWORDS: Small Business Innovation Research Program, SBIR

ANALYSIS OF ARMED SERVICES BOARD OF CONTRACT APPEALS, GENERAL ACCOUNTING OFFICE, AND FEDERAL COURT DECISIONS ON BEST VALUE IN FEDERAL PROCUREMENT

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This thesis analyzed four significant rulings by the Federal Courts, Armed Services Board of Contract Appeals, and General Accounting Office with respect to disputes regarding the *best value* selections in Government procurement and recommended ways to integrate these lessons into procurement organizations.

Best value entails the use of weighted factors that reflect the relative importance of each factor to the user. This allows the introduction of past performance, experience, technical approach, and other factors to be considered in addition to price.

The thesis analyzed the issues of four specific cases to determine if there is a pattern of weakness in a specific area of *best value* implementation. The aim is to bring any weaknesses to the attention of the acquisition professional in order to promote better application of *best value* and avoid future disputes, or at a minimum eliminate sustained disputes against the Government.

This thesis also looked at the commercial sector use of *best value* selections to view the similarities and differences that can be used to compare strengths and weaknesses of the Government's approach.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Acquisition, Best Value, Contracts, Evaluation, Procurement, Source Selection.

THE POTENTIAL ROLE OF THE UNITED STATES MARITIME SERVICE (USMS) IN SUPPORTING READY RESERVE FORCE VESSEL CREWING NEEDS

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Because of concerns about possible Merchant Mariner manpower shortages or skill mismatch needed to crew DoD organic vessels during a major contingency, the Maritime Administration (MARAD) has proposed the development of a guaranteed surge pool of experienced inactive mariners available to ensure timely and adequate manning of its Ready Reserve Force (RRF). This pool would be a supplement, not a replacement, to the current active pool of mariners used to crew the RRF. This initiative is centered on using the United States Maritime Service (USMS) concept. Two main options were proposed: create a stand-alone USMS program under MARAD, and/or integrate the USMS concept with Navy's Merchant Marine Reserve (MMR) program.

Fourteen structured interviews were conducted with strategic sealift stakeholders and experts in order to provide MARAD and the Navy with elements of how these pools/programs could be developed and to identify the option that stakeholders believe is the best approach. Interview results revealed that a stand-alone USMS program, providing it could overcome various obstacles, was the preferred approach. Analysis and recommendations are provided on how both pools could be developed and what issues need to be resolved prior to either program implementation. An alternate approach to use the MMR program for RRF crewing is provided as well.

DoD KEY TECHNOLOGY AREA: Other (Strategic Sealift, Transportation)

KEYWORDS: Ready Reserve Force, United States Maritime Service, Merchant Marine, U.S. Navy Merchant Marine Reserve Program, Manpower, Sealift, Marine Transportation

ALTERNATIVE COMMAND FUNDING AND FUNCTIONAL ORGANIZATION AT THE SPACE AND NAVAL WARFARE SYSTEMS COMMAND (SPAWAR)

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This thesis examines funding sources for two Space and Naval Warfare Systems Command (SPAWAR) System Centers. SPAWAR System Centers Chesapeake and SPAWAR ITC, located in New Orleans, are the focus of this thesis. This thesis conducts a through review of the current funding structure at each SPAWAR System Center. Funding options available to SPAWAR System Centers are mission funding, which are monies appropriated by Congress, and reimbursable funding, which are monies recovered from customers for services rendered. Strengths and weakness of each funding method are analyzed for potential improvement. Each SPAWAR System Center's business base is also studied in regard to opportunities to grow the existing customer base and to identify potential threats to current market share. After careful examination of existing funding methods and in-depth interviews with top financial officials at the different SPAWAR System Centers, change recommendations to existing funding requirements and organizational structure are presented.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Cost Analysis, Command organization, SPAWAR Organization

LESSONS LEARNED FROM A WEB BASED DISTRIBUTED LEARNING CASE STUDY: EVALUATION OF COURSE DESIGN, MODULES, EFFECTIVENESS AND STUDENTS' PERFORMANCE AND REACTIONS

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This thesis evaluated the first iteration of Navy Postgraduate School (NPS) on-line course 'Space Systems – Technology and Applications.' The thesis goal was to evaluate: course design; course effectiveness; student expectations and motivation before and affective reactions after the course; and typical patterns of on-line learning behavior according to Long's theory. Ultimately, the thesis intended to derive lessons learned and recommendations for future distributed learning (DL) courses and future research in this area.

There were thirty regular, resident NPS students in the sample. Data was collected from nine sources: four on-line questionnaires, Student Opinion Forms, on-line tracking, final grades, interviews with students, and interviews with the instructor.

Even though the course first course taught by this instructor, it was successful. Student expectations, motivation, affective and utility reactions were predominantly positive. For students, the most important advantage of the course was time flexibility and convenience. Students and the instructor agreed about central role of interactivity/feedback in a DL, which should be included into models of training effectiveness evaluation. Long-Dziuban's protocol results were surprising, but solid conclusions cannot be made without focused research. Results provided several recommendations about the course design, pedagogical improvements, instructional counseling, and future research.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Distributed Learning, Web-Based Training, Training Evaluation

AN ASSESSMENT OF TURKISH DEFENSE INDUSTRY AND TURKEY'S EFFORTS TO TRANSFER MILITARY TECHNOLOGY: STRATEGIES FOR ARMING THE FUTURE

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The end of the cold war has created a safer environment for most nations and reduced the need for fielding huge armed forces and vast investments for defense. However, due to her very special strategic position and historical responsibilities, Turkey still faces a range of substantial threats to its national interests, physical security, economic well being. These threats require the maintenance of a broad set of military capabilities in order to deter, and if necessary, to fight and win any future conflict. This thesis investigates the Turkish Defense Industry and Turkey's efforts to transfer military technology to establish a required technological base for a self-sufficient defense industry, which can fulfill the needs of the Turkish Armed Forces and stay competitive in a rapidly changing market place. The goal of this project is to evaluate the present Turkish Defense Industry and to present strategies that should be carefully considered in

developing a sound defense industry and technological base policy. It addresses the defense industry and technology transfer issues as well as Turkey's security policy and future defense requirements. We make use of industry literature, trade publications, United States, Turkish and several other international government and non-government resources, and professional publications.

DoD KEY TECHNOLOGY AREA: Other (Technology Transfer)

KEYWORDS: Turkish Defense Industry, Technology Transfer

A STUDY OF CONTRACT TYPES USED BY THE ARMAMENT CORPORATION OF SOUTH AFRICA (ARMSCOR)

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Defense acquisition in the Republic of South Africa is performed by the defense procurement agency called the Armament Corporation of South Africa (Armscor). The agency is faced with the challenge to acquire products and services effectively and efficiently and within a limited budget. One of the elements that contribute to increased efficiency in procurement is the reduction of contract risk. The agency's regulations presently allow the use of fixed-price contracts that limits its capability to mitigate risks especially in the procurement of specialized and complex military products. The study is organized in the following manner. Firstly, it presents structures; policies and regulations that govern contract types. Secondly, it reviews contract types used by the U.S. Federal agencies and other countries. Thirdly, it analyses Armscor's contracting procedures related to contract types. Lastly, the study recommends contract types that are suitable for the South African defense agency and changes that should be adopted before they can be incorporated. The research recommends a contract type model for Armscor.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Armscor Contract Regulations, Federal Acquisition Regulation, Fixed-Price, Cost-Reimbursement, Incentive Contract Types

FINANCIAL ANALYSIS OF FEDERAL EMPLOYEE FINANCIAL DISCLOSURES TO IDENTIFY UNEXPLAINED AFFLUENCE AND FINANCIAL STRESS

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Espionage is an ever-present problem for the United States. Although the methods of espionage employed by foreign governments vary, the most common method of obtaining access to our intelligence is by purchasing intelligence from an individual with access to classified information. Spies committing espionage typically spend the money they receive and thus live a lifestyle beyond that sustainable by their legal income. The term "unexplained affluence" is used to describe those living beyond their legitimate means. On the other hand, employees suffering from "financial stress," i.e., those with overwhelming debt may be recruited by foreign governments for future spy missions. The purpose of this thesis is to examine alternative methods and techniques for evaluating the financial disclosures of certain federal government employees as a means of identifying employees exhibiting either unexplained affluence or financial stress. Employee financial disclosures were analyzed using trend, comparative, and financial analysis techniques both within and across time periods to determine whether the employee exhibited normal or abnormal financial characteristics. Trend analysis of this population's financial disclosure data revealed that low

correlation exists between income and assets, liabilities and net worth. The results of comparative and financial ratio analysis proved that employees exhibiting abnormal financial characteristics could be identified for further investigation using information obtained from external sources.

DoD KEY TECHNOLOGY AREA: Other (National Security)

KEYWORDS: Espionage, Unexplained Affluence, Financial Stress, National Security

THE 12-PHASE ACQUISITION PROCESS: A COMPARISON OF THEORY VS. PRACTICE

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The 12-Phase Acquisition Process was developed by the faculty of the School of Business and Public Policy, Naval Postgraduate School (NPS), and is a cornerstone concept for every contracting class at NPS. The 12-Phases provide a distinct roadmap for the equipment user and a Contracting Officer to navigate the cycle to procure an equipment item. For this thesis, each phase in the 12-Phases is supplied with the pertinent elements (e.g., actions, analyses, events) primarily from the Federal Acquisition Regulation (FAR) Part 12 (Acquisition of Commercial Items) and the FAR Part 13 (Simplified Acquisition Procedures). Additionally, the thesis outlines and analyzes the acquisition process of 2nd Battalion, 1st Special Forces Group (A) using the 12-Phases. Results of the analysis reveal eight problems and shortcomings in the battalion's process. These problems hinder the battalion from achieving its goals of a best-price or best-value, minimum delay, detachment satisfying acquisition. Recommendations are made for the battalion to incorporate elements of the 12-Phases into its acquisition process to better achieve its goals.

DoD KEY TECHNOLOGY AREA: Other (Acquisition, Contracting)

KEYWORDS: 12-Phase Acquisition Process, Defense Acquisition, Simplified Acquisition Process

AN ANALYSIS OF BUDGET EXECUTION IN ZIMBABWE AND SUGGESTED IMPROVEMENTS

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In Zimbabwe, the Government has been experiencing problems with budget formulation and control of expenditures by Ministries and departments. Through the adoption of a three-year-rolling budget in 1995, ministries were forced to forecast, focus and justify their requirements hence better planning. Despite this forward planning approach, budget execution problems have persisted as evidenced by over-expenditures, fraudulent activities and other related problems leading to centralize expenditure control at the Central Payments Office (CPO). The persistence of the problems led to the introduction of a Public Finance Management System (PFMS) starting in 2001.

This thesis aims to contribute towards finding a solution to the persistent budget execution problems. It describes important budget formulation and execution processes, statutes and organizations and their functions. The analysis shows that there is need to change the current system of doing business. Finally, it concludes by recommending that some statutes be changed and that new processes incorporating appropriate information technology (IT) be adopted.

DoD KEY TECHNOLOGY AREA: Other (Budgeting in Government)

KEYWORDS: Budgeting, Formulation, Execution, Information Technology, Planning, Programming

FUNDAMENTAL DIMENSIONS OF FINANCIAL CONDITION IN THE FEDERAL GOVERNMENT

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Historically, financial reports of federal agencies focused on budgetary accounting, the reporting of obligations and expenditures of appropriated funds. The Chief Financial Officers (CFO) Act of 1990 and subsequent legislation significantly changed this pattern by requiring the 24 largest government agencies to reorganize their financial staffs and establish Chief Financial Officers to reform accounting procedures and reporting. To achieve the goals of the financial reform acts, it must be determined if executive agencies are improving financial management. This determination may be facilitated by systematic financial analysis of agency operations using information provided in agency financial reports. The objective of this thesis is to examine financial ratios calculated from federal financial statement information in order to identify fundamental dimensions of financial condition within the federal government and the ratios representative of those dimensions. Statistical analysis of financial ratios using factor analysis was used to determine the fundamental dimensions of financial condition. The results indicate that nine fundamental dimensions of financial condition underlying the numerous financial ratios exist within the federal government. The dimensions are comprehensive in that they reflect the variance existing in the larger set of financial ratios. Individual ratios can be selected to represent or measure each dimension. These dimensions and ratios provide an approach to conducting a financial analysis.

DoD KEY TECHNOLOGY AREA: Other (Federal Financial Analysis)

KEYWORDS: Federal Government, Financial Ratios of Financial Condition, Factor Analysis, Indicators of Federal Agency Financial/Economic Health

FLYING HOUR PROGRAM CASH MANAGEMENT AT COMMANDER NAVAL AIR FORCES PACIFIC

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The FY 2000 Flying Hour Program (FHP) comprised $3.2 billion of the Operations and Maintenance, Navy (O&M, N) appropriation, nearly half of which was allocated to the Commander Naval Air Forces Pacific (CNAP) for flight operations and aircraft maintenance. Insufficient funding has made it impossible to execute the FHP to the Navy Primary Mission Readiness standard of 83 percent.

This thesis analyzed CNAP FHP cash management for fiscal years 1998, 1999, and 2000, including techniques used by managers to execute the under-funded FHP. It concluded that CNAP managers use risk contingent cash management strategies and techniques to fund requirements while carefully avoiding Anti-deficiency Act violations. These techniques include delaying required aviation repairs to future years, reducing at home squadron flying hours and using Unfilled Customer Orders.

Navy budgeting does not recognize valid liabilities for some FHP related programs. The FHP is treated as discretionary and used annually as a source to pay these recurring liabilities, causing CNAP to be reactive in cash deficit control, always in need of fiscal rescue. CNAP transaction costs are increased by constant management of funding shortfalls. The risk of failing to meet fleet readiness requirements has grown as a consequence.

DoD KEY TECHNOLOGY AREA: Other (Flying Hour Program)

KEYWORDS: Flying Hour Program, DoD Budgeting and Execution, Naval Aviation

A COMPARISON AND ANALYSIS OF THE ESTIMATED SERVICE LIFE OF CARRIER-BASED TACTICAL AIRCRAFT AS IMPACTED BY OPERATIONAL TEMPO

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This study examines the impact of high operational tempo upon the projected inventory of carrier-based tactical aircraft. It specifically looks at the effect of higher than expected number of catapults launches and arrested landings (cats/traps) upon the available inventory of F/A-18C Hornets (with service life extension modifications to the airframe), F/A-18C Hornets (without service life extensions), F/A-18E/F Super Hornets and Joint Strike Fighters, Carrier Variant. The op tempo effect is examined for each of these aircraft individually and for the impact upon the total naval carrier-based tactical air force. The findings show that high tempo operations reduce the number of available aircraft in later out-years. The study also shows that the service lives of each aircraft type are years shorter than Navy projections. Recommendations are made for the implementation of a catapult and arrestment accrual rate management program.

DoD KEY TECHNOLOGY AREA: Air Vehicles

KEYWORDS: Aircraft Service Life Limitations, Airframe Management, Service Life Extension Program, SLEP

LOGISTICS PLANNING FOR DEPLOYMENT: A COMPARATIVE STUDY OF THE ROYAL NORWEGIAN AIR FORCE AND THE UNITED STATES AIR FORCE

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Deployment operations abroad are a new challenge to the Royal Norwegian Air Force (RNoAF). This thesis compares the logistical planning that is carried out in the United States Air Force (USAF) and in the RNoAF in order to achieve operational effectiveness during deployment operations.

Logistics relationships, assets and planning tools that influence logistics efficiencies in the two air forces are identified and analyzed. By comparing the planning process in the two organizations, important factors in the planning, deployment and sustainment phases are identified. These factors help determine how logistics efficiencies can contribute to operational effectiveness.

With declining spending on defense, air forces need to improve logistics efficiency in order to maintain the required level of operational effectiveness. An air force needs to develop the right mixture of logistics investment in structure and assets versus efficient logistics processes. In order to achieve the right mixture of logistics, knowledge of the interrelated logistical and operational factors is required, and trade offs have to be made.

The thesis recommends that further research be undertaken to determine the appropriate factors that contribute to efficient logistics in support of deployments.

DoD KEY TECHNOLOGY AREA: Other (Logistics)

KEYWORDS: Logistics, Logistics Planning, Logistics Support, Logistics Concepts, Agile Logistics, Logistics Organization, Policies, Deployment, International Operations, Royal Norwegian Air Force, United States Air Force

AN ANALYSIS OF THE CONSOLIDATION OF MARINE CORPS PURCHASING AND CONTRACTING SERVICES THROUGH A GEOGRAPHICAL REGIONAL OFFICE

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In response to DoD personnel downsizing and decreased budgets, the Marine Corps has sought ways to combat these restraints through acquisition reform initiatives such as regionalization. This thesis examines the consolidation and restructuring of five Marine Corps contracting activities located in the Southwest region of the United States. The objective of this study was to develop a regionalized infrastructure in order to reduce costs, improve efficiency, and optimize resources to best support the customer. To accomplish this objective, interviews were conducted of military and civilian contracting personnel in the Southwest region. The interviews obtained information about the strengths, weaknesses, and potential obstacles to the implementation of a regionalized contracting office. Based upon the research and interviews with members of the regional contracting community, this thesis developed a framework for a regionalized contracting infrastructure through the use of an organizational systems model. This model assists in creating a unified command structure, standardizes policy and procedures, enhances the efficiency and effectiveness of the organization, and eliminates duplicative functions and processes. This thesis is a proactive approach to the consolidation and restructuring of contract billets to achieve cost reduction and streamline the contracting force in the region.

DoD KEY TECHNOLOGY AREAS: Manpower, Personnel, Training, Materials, Processes, Structures

KEYWORDS: Contracting, Regionalization, Infrastructure, Consolidation, Marine Corps

RECONSTITUTION COSTS OF AIRCRAFT LAUNCH AND RECOVERY EQUIPMENT DUE TO CONTINGENCY OPERATIONS

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Since the end of the Cold War, the United States Navy has been involved in many peacekeeping and disaster relief operations worldwide. Most of these Operations Other Than War (OOTW) have been unanticipated and therefore unbudgeted. The marked increase in the occurrence of these contingency operations compelled Congress to establish the Overseas Contingency Operations Transfer Fund (OCOTF) in 1997. This fund is used to reimburse the service components for their expenditures in support of contingency operations. However, due to the uncertainty involved in these contingencies, the Department of the Navy (DoN) has found it very difficult to estimate and subsequently identify costs associated with the contingency operations. This thesis develops a defendable method of assigning Aircraft Launch and Recovery Equipment (ALRE) maintenance and repair costs to contingency operations based on the number of sorties flown. The model was derived through regression analysis of catapult shots using underway days and Primary Mission Readiness (PMR) as explanatory variables. This model should aid the DoN in both predicting and identifying costs attributable to contingency operations and lend credibility to the DoN's request to the Office of Management and Budget (OMB) for reimbursement.

DoD KEY TECHNOLOGY AREA: Other (Contingency Operations)

KEYWORDS: Aircraft Launch and Recovery Equipment, Contingency Costs, Reconstitution Costs, Regression Analysis, Overseas Contingency Operations Transfer Fund

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM – NAVY: ANALYSIS AND RECOMMENDATIONS

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In 1998 the Chief of Naval Operations directed the U.S. Navy to begin a transition from navigating using conventional paper charts, to the use of an electronic charting system (digital charts). In response, the Electronic Chart Display and Information Systems-Navy (ECDIS-N) instruction was issued. This new technology will presumably reduce or prevent future collision and grounding incidents associated with navigational errors. The objective of this study is to determine the best possible ECDIS-N capable system or systems that will meet the future needs of the Navy. Also examined, are the possible annual repair cost savings that an ECDIS-N system could realize for the Navy. Data for two different periods of Navy collisions and groundings were compared and used to estimate the average incidents per ship and the average annual repair cost incurred by the Navy. The cost, capabilities and limitations of alternative ECDIS-N systems are evaluated in a cost-benefit comparison that justifies the Navy's implementation of certain ECDIS-N systems in different classes of ships. It is estimated that an ECDIS-N system integrated with an Automatic Radar Plotting Aid could have prevented 47% of the Navy's collisions and groundings from 1998 to 2000, saving 96.4% of the combined repairs costs.

DoD KEY TECHNOLOGY AREA: Other (Navigation)

KEYWORDS: Electronic Charting, Digital Navigation

FACTORS AFFECTING FIRST-TERM REENLISTMENT DECISIONS IN THE UNITED STATES ARMY

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The purpose of this thesis is to analyze factors that influence first-term reenlistment decisions in the United States Army. The main focus of the thesis is the analysis of information collected from soldier's official records that bear on the reenlistment decision. Data from the U.S. Army Small Tracking File (STF) and records from the Defense Manpower Data Center (DMDC) cohort files were employed. The Army currently categorizes enlistees into ten characteristic groups (C-groups) based on gender, education, Armed Forces Qualification Test (AFQT) scores, and initial enlistment term. This thesis examined data across all C-groups and for enlistees from three cohorts: 1990, 1991 and 1992. The data was evaluated using descriptive statistics, cross-tabulation analysis, and logistics regression. The estimated model compares the results across C-groups using C-group 1 as the base group. Results indicate that certain factors affect the various C-groups differently. Not all factors were significant for all C-groups, but race, age, and youth organization participation were key influences across most C-groups. The family status and enlistment term variables were significant, however, they affected men and women differently. This thesis should be helpful to Army personnel responsible for establishing reenlistment policy.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Retention, Attrition, Recruiting, Multi-Nomial Logit Model, JROTC, Enlistment incentive

ASSESSING THE OUTCOMES OF REGIONALIZATION IN THE NAVY REGION, SOUTHWEST

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Regionalized base operating support management was implemented in the Navy Region Southwest on 1 October 1998, as part of a Navy-wide plan to reduce infrastructure costs and improve services. Due to the scope of this reorganization, the full effect of the change in terms of measurable cost-savings and improved customer service will not be realized for at least five years. However, interim effects may be analyzed.

This study conducts a mid-transition review and analysis of the current outcomes in terms of cost savings and level of service in the Navy Region Southwest to evaluate the effectiveness of the regionalization process. Specifically, the study examines the strengths and weaknesses of regionalization to determine if the goals set forth in the Chief of Naval Operations Strategic Plan when restructuring began are being met: to apply state-of-the-market business practices and reduce infrastructure costs to improve efficiency and increase customer service quality. Findings indicate that, although the Region faces budgetary challenges, the processes established through regionalization are reducing costs and improving the overall level of service for customers throughout the Region.

DoD KEY TECHNOLOGY AREA: Other (Installation Management)

KEYWORDS: Regionalization, Shore Installation Management, Navy Region, Southwest, Infrastructure

OUTSOURCING MARKET RESEARCH IN DEPARTMENT OF DEFENSE COMMODITY ACQUISITION: THE ISSUES, CONCERNS, AND PRIVATE INDUSTRY CAPABILITIES

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This thesis investigates the role of market research in Department of Defense commodities acquisition. It examines the feasibility of outsourcing market research functions in this acquisition arena, focusing on which elements of market research would be most practicable to outsource, and what capacity exists in private industry to provide market research services for the Federal acquisition environment.

Given the reduction in the defense acquisition workforce, budgetary constraints, and emphasis on acquisition reform, effective market research significantly enhances optimal use of available resources. However, general consensus among defense acquisition professionals is that market research is not conducted as effectively as possible due to limitations of time, training and management attention. While legislation has directed the use of market research for multiple aspects of the acquisition cycle, to include requirements development, maximization of competition, source selection, and emulation of better business practices, market research skills vary among DoD acquisition personnel, as does appreciation for its value as a management tool.

The conclusion is that while there are issues and concerns to be addressed when considering outsourcing market research, private industry does offer a viable alternative for conducting market research functions in DoD commodity acquisitions.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Market Research, Commodity Acquisition, Outsourcing, Market Surveillance, Market Investigation, Purchasing Research

CONTRACT SECURITY IN THE PAPERLESS REALM

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This thesis examines the security vulnerabilities facing the Standard Procurement System and argues that security issues impede the implementation of the system. It proposes two IT security enhancements as a solution: (1) reformation of DoD security policy and procedural guidance and (2) a security solution tailored for special contracting offices that require security above the Sensitive but Unclassified (SBU) level.

These solutions involve Public Key Infrastructure (PKI), smart card technology and biometrics authentication.

DoD KEY TECHNOLOGY AREA: Acquisition and Contracting, Computing and Software

KEYWORDS: Standard Procurement System, Computer Security, Public Key Infrastructure, Smart Card Technology

A CASE STUDY OF THE ARMY REVERSE AUCTION

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Acquisition reform has attempted to change the procurement process over the past several years. Some believe the reform measures have been changes in policy or revisions of a paperwork process. The draw down of the workforce and financial constraints demand acquisition professionals conduct business in a smarter, more efficient manner. The technology today provides Internet platforms that allow the commercial marketplace to take advantage of electronic commerce. The Army has implemented a reverse auction program designed to capture many of the practices in use in the commercial industry. Foremost, dynamic pricing replaces fixed pricing models observed in traditional procurement strategies. Reverse auctions offer the Government the means to replicate a successful commercial practice that is becoming the accepted way of doing business. This thesis reviews performance of the Army's Reverse Auction pilot program after its first year of use. Three buying cases and 40 other reverse auctions are reviewed. The comparative analysis identifies commonalities for success and differences between past experiences with the reverse auction. The thesis concludes acquisitions for items that resemble commercial products and based on price are most successful in reverse auctions. The 43 auctions reviewed resulted in $1,606,395 saved. The mean savings was 21.83% for the auctions reviewed.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Acquisition Reform, Reverse Auction, Pricing

AGING AIRCRAFT WIRING: A PROACTIVE MANAGEMENT METHODOLOGY

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During the last years, military budgets have been dramatically reduced and the services have been unable to acquire sufficient new systems. Military aviation is one of the areas that have been severely impacted. The result is that the current fleet faces significant aging aircraft problems.

Aircraft wiring is one of the areas that have severely affected by the aging process. Recent accidents involving aging wiring problems and reduced operational readiness due to aging wiring have made clear that aging aircraft wiring presents a difficult and complicated problem for the military aviation. However, current maintenance practices fall short in successfully inspecting and maintaining wiring.

The purpose of this thesis is to provide a proactive management plan to deal with aging wiring. The objective is to come up with a systematic process in order to identify and prevent serious failures caused by electrical faults of wiring systems. This process will be based on the principle of Reliability Centered Maintenance (RCM).

DoD KEY YECHNOLOGY AREA: Air Vehicles

KEYWORDS: Aging Aircraft, Aircraft Wiring, Reliability Centered Maintenance

NON-MONETARY PERFORMANCE METRICS FOR USE IN A TECHNOLOGY EXCHANGE ORGANIZATION

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The Joint Technology Exchange Group (JTEG), a part of the Joint Depot Maintenance Activity Group (JDMAG), exists to disseminate information on new technologies throughout the DoD depot community. Its objectives are to reduce redundancy and enhance the capabilities of depots, potentially lowering sustainment costs for the equipment they work on. However, because JTEG operates in a technology environment where financial benefits are vague and uncertain, JDMAG has identified a need to assess the effectiveness of the JTEG. To judge which attributes are most beneficial, this thesis performed a review of technology transfer, value of information, communication, and current performance measurements in organizations. Four depots were visited to understand their use of new technology. An analysis of the roles and abilities of JTEG and needs of the depots is done, and metrics are developed to properly capture the effectiveness of JTEG. Performance metrics are based on balanced scorecard methodologies to emphasize effort that is linked to goals. The study finds the service JTEG supplies is not in line with what depots demand. The performance metrics highlight two major areas of activity for JTEG, processes and projects. Metrics generative are primarily non-monetary in nature, and bring visibility to how effort is linked to organizational goals. This study has applicability to other service-oriented, public organizations.

DoD KEY TECHNOLOGY AREAS: Materials, Processes, and Structures, Manufacturing Science and Technology

KEYWORDS: Technology Transfer, Information Exchange, Performance Measures, Metrics, Depot Maintenance

MODERNIZATION OF THE CZECH AIR FORCE

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This research explores the decision-making problem for the purchase of modern fighter aircraft for the Czech Republic. This represents a specific case of a complex issue of military hardware acquisition.

The author starts with a general overview of Czechoslovak and Czech Air Force's (CAF) history and the major stages of its development. This historical overview is followed by a description of the present situation of the CAF with the emphasis on current problems. The CAF operates obsolete second-generation aircraft, rapidly approaching the end of their operational life. A partial solution would be a purchase of 72 L-159 Advanced Light Combat Aircraft to supplement 36 front-line fighters.

The aircraft under consideration are F/A-16, F/A-18, Mirage 2000-5, JAS-39, and Eurofighter. The MiG-29 SMT is included for comparison. The main contribution of this study is a prediction of Life Cycle Costs (LCC) for each aircraft together with an estimate of quality or relative effectiveness based on TASCFORM-AIR model. These should be the most important criteria for proper decision-making.

The study includes a brief description of the Czech economy, military budget, a summary of world industrial base, and future military aircraft developments. A final recommendation is provided.

DoD KEY TECHNOLOGY AREA: Air Vehicles

KEYWORDS: Czech Air Force, Fighter Aircraft, Life Cycle Cost, Aircraft Effectiveness

ANALYSIS OF THE U.S. ARMY ASSIGNMENT PROCESS: IMPROVING EFFECTIVENESS AND EFFICIENCY

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Since the conclusion of the Cold War and subsequent downsizing, the U.S. Army has struggled with the challenge of recruiting and retaining the highest quality soldiers to ensure future readiness. Each year, the Army plans and executes over 100,000 permanent change of station assignments for its 345,000 enlisted soldiers. The inherently complex challenge of assignment planning consists of balancing Army requirements and readiness with soldiers' professional needs and personal preferences. The Army's centralized and hierarchical assignment process could be improved using proven information technologies. Specifically, the process could be made more efficient using web-based markets and intelligent agents to more effectively plan and assign soldiers to billets. This thesis evaluates the strengths and weaknesses of the Army's assignment process and its outcomes, compares and contrasts it with the Navy's assignment process, estimates and evaluates the utility of one- and two-sided matching processes using a computer simulation, and makes recommendations, where appropriate.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Army, Assignment, Manpower, Detailing, Retention, Quality of Life

IMPROVING LIFE-CYCLE COST MANAGEMENT IN THE U.S. ARMY: ANALYSIS OF THE U.S. ARMY AND COMMERCIAL BUSINESSES LIFE-CYCLE COST MANGEMENT

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The roles and responsibilities of the Army acquisition and logistics communities, as they pertain to the life-cycle management, are undergoing fundamental change. The early identification and total control of life-cycle cost, in particular operations and sustainment costs which comprises as much as 70-80% of a systems total life-cycle cost, is a high priority for the Army. The basis of this change is adoption of commercial best practices to support the Army's goal to organize, train, equip, and manage multiple missions in the most cost effective manner.

This thesis describes how the U.S. Army and four commercial businesses (FEDEX, Boeing Commercial Airplanes, Lockheed Martin, and a Communications Systems Company) manage life-cycle costs (LCC) for the equipment they use to manufacture products or to provide services. The research analyzes how the U.S. Army compares to these commercial businesses and how they are organized to perform the key functions of acquisition and sourcing, and operations and sustainment, to provide quality products or services to their customers while controlling total life-cycle costs of the capital equipment they use to provide their product or service. The thesis concludes with recommendations on how the U.S Army can best organize and focus to better manage the total life-cycle costs of the equipment they purchase to complete their mission.

DoD KEY TECHNOLOGY AREA: Other (Management and Acquisition)

KEYWORDS: Life-Cycle Cost Management, Organization Design And Functions, Commercial Best Practices, Operation And Sustainment Costs, Acquisition

MAJOR WEAPON SYSTEMS ACQUISITION AND LIFE CYCLE COST ESTIMATION: A CASE STUDY

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The Major Weapon Systems Acquisition Process requires the acquiring organizations to make long-term resource commitments, whereas the defense budgets of many nations have declined over the past decade. Therefore, it is imperative for program managers and acquisition practitioners to make informed decisions not only considering the up-front costs, which are related to fielding of the system, but considering all the costs expected to be incurred throughout the system's planned life.

In this study, the major systems acquisition process, and its underlying concepts, life-cycle costing, and cost estimation techniques have been discussed, and the strategies that enable the PMO to optimize the life-cycle cost of the system are studied in a case study approach. The ATACMS IA missile system has been chosen as the study case. The life-cycle cost of the ATACMS IA missile system has been estimated; sensitivity and uncertainty analyses have been conducted by utilizing the Cost Analysis Strategy Assessment (CASA) estimating model in order to develop strategies, which will which will eventually reduce the life-cycle cost of the system. The performance and cost figures used in the model are assumed by the author, due to sensitivity of the actual data. However, the model and the analysis results provide valuable guidance for the PMO, and the analysis methodology is applicable to any weapon systems acquisition program.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Major Weapon Systems Acquisition, Life Cycle Cost Estimation, Systems Engineering, Sensitivity Analysis, Uncertainty Analysis, Acquisition Logistics